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Factors Associated with Constraints Perceived by Duck Farmers in North Eastern Zone of Tamil Nadu

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ABSTRACT

The study was conducted to identify and rank the production and management, marketing and financial constraints of duck farming in north eastern zone of Tamil Nadu. The primary data from sample farmers were collected by personal interview method using simple probability random sampling procedure. A Likert scale was used to analyse the constraints and multiple linear regression was applied to analyse the factors associated with constraint. Disease and mortality, seasonal price fluctuation and lack of capital were the foremost constraints experienced by duck farmers. The Multiple linear regression model results showed that the coefficient of determination (adjusted R square) was 0.87 and also statistical significance (P< 0.01) was obtained in ANOVA. Among the independent variables used in the model, occupation (P ≤ 0.01), mortality percentage (P ≤ 0.05) and type of rearing (P ≤ 0.05) were found to be positively associated with constraints score whereas the variables like experience and vaccination were negatively associated with the constraint score. We can reduce the disease mortality and morbidity by creating awareness regarding vaccination schedule. Intervention by the government is needed to set proper efficient marketing channel for the duck farmers to minimize the price spread of marketing. To avoid exploitation by middle men, organizational committees are needed as that of chicken egg price fixing Committees.

Key words: *Duck farming constraints, Perception, Associated factors.*

INTRODUCTION

Nowadays the cost of conventional meat like chicken, mutton and chevon getting raise at increasing rate due to shortage of supply to the market. Duck meat has greater potential to capture the gap of existing meat marketing with other meat products. Duck farming in India is characterized by nomadic, extensive, seasonal farming and it is still held in the hands of small and marginal farmers and nomadic tribes. There are three systems of duck rearing in India i.e., free range system, Confined system and Indoor system[6]. The indigenous duck varieties of Tamil Nadu have evolved over the years with better adaptability, production potentiality and other utility characters.

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In Tamil Nadu 70 per cent of the duck population is concentrated in six districts namely, Kancheepuram, Thiruvallur, Villupuram, Cuddalore, Vellore and Thiruvannamalai, falling under northern agro-climatic zone of Tamil Nadu[8]. Existence of different indigenous duck varieties namely Arni, Sanyasi and Keeri[3,10] with distinct phenotypic characters and better production potential in northern districts of Tamil Nadu. In Tamil Nadu duck rearing is practiced as a profitable traditional backyard enterprise. The eggs produced in this state were transported to Kerala, the adjoining state[3]. Ducks in Tamil Nadu are traditionally reared as family poultry following free range scavenging system. Farmers, who cannot afford to keep large animals because of the big investment required, can easily maintain a few ducks within their homestead premises[2].

MATERIAL AND METHODS

The study was conducted in north east zones of Tamil Nadu, which comprises 58.34 per cent of the duck population of the state (Livestock census of Tamil Nadu, 2012). Based on the share of duck population, the highest duck populated districts viz., Thiruvallur (25.9 per cent), Kanchipuram (12.55 per cent) and Villupuram (10.43 per cent) districts were selected for this study. From these selected districts, a proportionate random sample of 100 farmers according to population were selected by simple random sampling procedure. To achieve the objectives of the study, primary data was collected by personal interview method using pre-tested interview schedule specifically designed for this study. A Likert scale presents the respondent with a statement and asks the respondent to rate the extent to which he or she agrees with it. The original version of the scale included five response categories and each scale was assigned a value. The most negative response was given a numerical value of 1, the most positive response was given a numerical value of five (1 = Very severe constraint, 2 = Severe constraint, 3 = Moderate constraint, 4 = Low constraint, 5 = Not constraint). The answer given by each duck farmer was added for every single constraint, which would give the intensity/severity of the particular constraints. Based on the order of score obtained by every constraint, the constraints were prioritized.

A linear model was used to determine factors contribution with intensity of constraints perceived by duck farmers. A multiple regression analysis was used to estimate the model.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots\ldots + \beta_n X_n + \mu$$

Where,

Y = Intensity of constraints

X_i = Independent variables

α = Intercept

β_i = Regression coefficients to be estimated

μ = stochastic disturbance term

Table No.1 Explanatory variables of constraint perceived by duck farming

X_i	Explanatory Variables	Levels	Specifications
X_1	Age of the duck farmer	Continuous	In years
X_2	Experience in duck farming	Continuous	In years
X_3	Education level of the duck farmer	Four	1- If illiterate 2- If primary 3- If secondary 4- If collegiate
X_4	Main Occupation	Three	3- Agriculture and Others 2- Animal Husbandry 1-Duck farming
X_5	Income of family	Continuous	Income of the family in Rupees
X_6	Land holding of duck farmers	Continuous	In acres
X_7	Labour	Continuous	Labour in day hours
X_8	Flock size	Three	In head numbers
X_9	Source of capital	Two	1- If Others 2- If Self

X_{10}	Age of the Purchase (Stock)	Continuous	In days
X_{11}	Vaccination	Three	1- If Not followed 2- If Irregular 3- If Regular
X_{12}	Marketing Channels	Two	1- If Through Intermediates 2 – If Direct sale
X_{13}	Mortality Percentage	Continuous	Percentage Mortality
X_{14}	Type of Rearing	Two	1- Nomadic 2- Static

RESULTS AND DISCUSSIONS

Production and management constraints

Production and management constraint of duck farmers ranked in the table 2. The most important production and management constraint experienced by duck farmers was disease and mortality. Duck cholera, duck plague and mixed infections were the common fatal diseases of ducks identified in the study area. Tamizhkumaran *et al*. [9] stated that 90 percent of the respondents indicated that duck mortality was mainly due to duck plague and mechanical injuries during forage. Mandal *et al*.[5] also reported that the major identified constraints were high incidence of poultry disease, lack of suitable germ-plasm and attack by predators. Hoque *et al*.[4] found that mortality in ducks of Bangladesh was mainly due to higher occurrence of disease.

Table No.2 production and management constraints

Constraints	Constraint Score	Rank
Shrinkage of land for foraging	327	2
Restriction of land owners to foraging	268	6
Non availability of good chicks	213	9
Non availability of cheap feed ingredient	198	10
Water source problem	276	5
Disease and mortality	440	1
Predation by dogs, jackals and theft	325	3
Lack of technical advice	232	8
Medicine and vaccine availability	307	4
Veterinary service	263	7

Duck plague and concurrent occurrence of both duck plague and duck cholera (*P. multocida*) accounted for the highest frequency of duck diseases at around 32 per cent for each. Next to disease mortality the major constraint was shrinkage of forage land due to urbanization and industrialization. The other constraints in the descending order of importance were predation (dogs, jackals and theft), medicine and vaccine availability, water source problem, restriction of land owners to foraging, veterinary service, lack of technical advice and finally least constraint perceived by duck farmer was non-availability of good chicks.

Marketing constraints

Marketing constraint of duck farmers ranked in the table 3. Seasonal fluctuality of price of the duck egg and meat was the major marketing constraint perceived by duck farmers in the study area. More than 90 percent of the duck farmers were sold their duck eggs in the adjacent states like Kerala. The fluctuating price of the eggs was the major concern mainly during festival season in Kerala. The second most constraint perceived by the duck farmers was low price for the output. Duck farmers felt that the procurement price of duck egg at farm level was about ₹ 4-5 which was very low compared to selling price to the consumers was ₹ 9.50. Next to this, exploitation by the middle man, those who were collecting the eggs and birds from the farm level. This was mainly due to total dependency of contractor/dealers to market their products since the demand for the duck product was very minimal in local market. Gajendran and Karthickeyan[3] and

Tamizhkumaran *et al*. [9] reported that most of the duck farmers were depending on contractors/dealers for marketing their products (Egg and meat). Other constraints experienced by duck farmers were lack of marketing facilities, poor transport facility and the least constraint perceived by duck farmers were zoonotic panic among consumers like avian influenza disease outbreak.

Table No.3 Marketing constraints

Constraints	Constraint Score	Rank
Lack of marketing facilities	285	4
Low price for the output	340	2
Zoonotic panic among consumers	264	6
Poor transport	275	5
Exploitation by middleman	331	3
Seasonal fluctuality price	395	1
Any other, specify	187	7

Financial constraints

Financial constraints of duck farmers ranked in the table 4. Among the financial problems identified in duck farming, lack of capital was the foremost constraint experienced by duck farmers in the North Eastern Zone of Tamil Nadu. About 70 percent of the farmers had poor economic status in the study area. This leads to the over dependence of contractors or external sources for the credits to purchase ducklings. Similar to this Veeramani *et al*.[10] also reported that the inadequate finance was the main constraint encountered by duck farmers. Tamizhkumaran *et al*.[9] reported that about 76.9 per cent of the duck farmer's depended on the duck contractors and agents for initial investments. In this context they were also borrowing money from the contractor or credit providers. The share of contractor from the duck farming is high compared to duck farmers share. Due to this factors, farmers not getting reasonable income and also struggling to repay the borrowed debts. Hence the repayment of debts was another major financial constraint of duck farming experienced by duck farmers. The duck farmers has no access to credit provider since the duck farmers were poor and also they were unable to provide any collateral. High cost of inputs, lack of institutional support and lack of knowledge about financial support were the least constraints perceived by duck farmers.

Table No. 4 Financial constraints

Constraints	Constraint Score	Rank
Lack of capital	416	1
Lack of access to credit	345	3
High cost of input	340	4
Lack of knowledge	253	6
Repayment problem	359	2
Lack of institutional support	289	5

Factor associated with intensity of constraints perceived by duck farmers

The Multiple linear model was fitted to assess the interrelationship between the constraint score and socio economic factors such as age, experience, occupation, income, land holding, flock size source of capital, vaccination, marketing channel, mortality percent and type of rearing and labour.

Table No.5 Production and management constraints

X_i	Explanatory variable	Co efficient	t- Value	P-Value
α	(Constant)		31.943	.000
X_1	Age	-.121	-1.938	.056
X_2	Experience	-.554**	-8.262	.000
X_3	Occupation	.103**	2.777	.007
X_4	Income	-.028	-.743	.460
X_5	Land Holding	.047	1.250	.215
X_6	Flock size	-.038	-.968	.336
X_7	Source of Capital	.022	.588	.558
X_8	Vaccination	-.281**	-5.434	.000
X_9	Marketing Channel	-.019	-.496	.621
X_{10}	Mortality percent	.077*	2.103	.038
X_{11}	Type of Rearing	.087*	2.225	.029
X_{12}	Labour	.112	1.873	.064
R^2		0.88		
Adjusted R^2		**0.87**		
'F' value		57.34		
Number of observations		100		

Figure in parenthesis indicates standard errors
Dependent variable: Constraint score
***Significant (P≤0.05); ** Significant (P≤0.01)**

The Multiple linear model presented in table no 5 showed that the coefficient of determination (adjusted R square) is 0.87, indicating that 87 per cent variation in the dependent variable was explained by the independent variable included in the model. The ANOVA also exhibited that the model had a fit with the statistically significant F value of 57.34 ($P \leq 0.01$). Among the independent variables used in the model, occupation ($P \leq 0.01$) mortality percentage ($P \leq 0.05$) and type of rearing ($P \leq 0.05$) were found to be positively associated with constraints score. Whereas the variables like experience and vaccination were negatively associated with constraint score.

The result indicated that an unit increase in the experience in duck farming could minimize the constraint score. As experience raises, farmer can get better knowledge about various management practices in duck farming. An unit increase in the occupation could increase the constraints score of duck farming, which means those who were practicing duck farming as a main occupation perceiving less constraint compared to others.

The explanatory variable denoting vaccination had a negative significant association on constraint score. If the vaccination is regular, mortality and morbidity due to infectious disease like duck plaque would reduce. When type of rearing shifted to static type, farmers getting more constraint due to lack feeding resource availability in local.

SUMMARY AND CONCLUSION

Disease and mortality was the foremost management constraint perceived by duck farmers. By creating awareness regarding vaccination schedule and making availability of duck plague vaccines in local veterinary dispensary, we can reduce the disease mortality and morbidity. It can also create good communication with local veterinarians. Government intervention is needed, to set proper efficient marketing channel for the duck farmers to standardize the duck marketing and price. Organizational committees can be formed as that of chicken

egg price fixing committees to avoid middle men exploitation. To sort out the financial constraints, we can create credit access to the duck formers from reliable source with reasonable interest and thereby farmers can overcome the constraints perceived by the farmer.

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